

## REMARKS

As a preliminary matter, Applicants believe that there is a typographical error on the Notice of References Cited (Form PTO-892) related to United States Patent No. 5,301,975 to Rivera because this reference does not appear to relate to the subject matter of the present application. Clarification is requested.

Claims 1, 2, 7 and 10 stand rejected under 35 U.S.C. §112, first paragraph, as allegedly not being enabling. Applicants respectfully traverse this rejection.

Applicants respectfully submit that the language at issue, “an isotropy magnetic field is 0.8 kA/m or more,” is disclosed in the Specification on page 5, lines 1-2. Further, Applicants have also added new Claims 17-20, which include the language suggested by the Examiner (namely, “a saturated magnetic field is 0.8 kA/m or more”). As the language at issue is disclosed in the original specification, withdrawal of this rejection is respectfully requested.

Claims 1, 2, 7 and 10 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants respectfully traverse this rejection.

Applicants have amended Claims 1, 2, 7 and 10 to refer to a “laminated magnetic film” to avoid potential confusion related to the inclusion of non-magnetic layer(s). Additionally, Applicants have also amended the language related to the residual stress to define a range (“between approximately –0.5 GPa and +0.5 GPa”). As the language of the

claims has been clarified, withdrawal of this §112, second paragraph, rejection is respectfully requested.

Claims 1, 2 and 10 stand rejected under 35 U.S.C. §102(a) and §102(b) as being anticipated by the Katada et al. Publication as evidenced by *Intermetallic Compounds*. Applicants respectfully traverse this rejection.

The Katada et al. reference discloses a multilayered film, but the materials of the film are different from those of the present invention. Further, the magnetic functions between layers are also different from those of the present invention.

In Claims 1 and 17 of the present application, the nonmagnetic materials are limited to Ru, Rh, Ir, Cr (Claim 17 only), Cu (Claim 1 only), Au, Ag, Pt and Pd. By employing these materials as a base layer of the FeCo film, excellent uniaxial magnetic anisotropy can be gained, and further antiferromagnetic coupling can be gained in a multilayered film including FeCo films.

The Katada et al. reference discloses a base layer of NiFe(Cr) and a multilayered film of  $[FeCo/NiFe]_n$ . Unlike the nonmagnetic materials of the present invention, the NiFe(Cr) layer is not antiferromagnetically-coupled. Further, NiFe layers are used as intermediate layers of a multilayered film, but the multilayered film is different from that of the claims 1 and 17 because the NiFe layers have ferromagnetism.

In the present invention, the important factor for producing the saturated magnetic field (the anisotropy magnetic field) of 0.8 kA/m or more is the kinds of

nonmagnetic materials, not the film structure. The structure and functions of the film of Katada et al. are quite different from those of the present invention, so Applicants submit that the Katada et al. reference fails to disclose the invention of Claim 1, and withdrawal of this §102 rejection of independent Claim 1 and associated dependent Claims 2, 7 and 10 is requested.

With regard to dependent Claim 2, the Katada et al. reference does not describe a film whose residual stress is between approximately -0.5 kPa and +0.5kPa.

In some cases, magnetization curves of magnetic films are not changed even if the magnetic films are formed on substrates having different thermal expansion coefficients. There are several reasons for this. For example, in the case that NiFe base layers widely relieve stress from the substrates, and no stress is applied to FeCo layers formed on the NiFe layers, the magnetization curves are not extremely changed even if the residual stress of the multilayered films is great. The Examiner appears to believe that the magnetization curve of the film of Katada et al. is not changed due to small residual stress, but Katada et al. does not disclose concrete values of residual stress as the Examiner stated in the Office Action.

On the other hand, in the present application, concrete data is presented of changing the film forming conditions and changing the magnetic characteristics, so the present application discloses grounds for limiting the residual stress to between -0.5 kPa and +0.5 kPa.

Claims 1 and 2 stand rejected under 35 U.S.C. §102(b) as being anticipated by the United States Patent No. 5,587,026 to Iwasaki et al. Applicants respectfully traverse this rejection.

Applicants respectfully submit that the Iwasaki et al. reference fails to disclose all of the features of the present invention as defined in Claims 1 and 2. More specifically, independent Claim 1 has been amended to remove the element “Cr” from the list of materials for the nonmagnetic layer. In contrast, Example 8 of the Iwasaki et al. reference includes a Cr film for the nonmagnetic layer. Accordingly, for at least this reason, withdrawal of this rejection is respectfully requested.

Further, according to Example 8 of the Iwasaki et al. reference, it is not necessary to make the residual stress small. Example 8 includes a Cr base layer, but the disclosed purpose is as follows: “The Cr film is provided to maintain the adhesion strength of a magnetic film with the substrate.” *See* col. 15, lines 9-10. Unlike the present invention, no purposes of the antiferromagnetic coupling are disclosed or suggested in the Iwasaki et al. reference.

With regard to Claim 2, in Example 8 of Iwasaki et al., the value Hc was reduced from 200 to 30 A/m by annealing. However, the Iwasaki et al. reference does not disclose that the value Hc was increased by stress. Further, it is unclear that the value of Hc was reduced by reducing the stress. Applicants believe that the FeCo film of Example 8 was

re-crystallized by annealing at a high temperature, such as 550-700°C, so that the value of Hc was reduced.

With regard to new Claim 17, this claim includes two or more nonmagnetic layers, which is a feature not disclosed in the Iwasaki et al reference.

Claim stands rejected under 35 U.S.C. §102(b) as being anticipated by the United States Patent No. 5,304,975 to Saito et al. Applicants respectfully traverse this rejection. The Saito et al. reference fails to disclose the laminated magnetic film of Claim 1 that includes, *inter alia*, “a magnetic layer including Fe and Co.” In contrast, the magnetic layer of Comparative Example 1 of Saito et al. (col. 7, lines 32-53) is made of Co alone (col. 33-34). Accordingly, withdrawal of this §102(b) rejection of independent Claim 1 and associated dependent Claims 2, 7 and 10 is respectfully requested.

Further, with regard to new independent Claim 17, Comparative Example 1 of the Saito et al. reference also lacks the claimed nonmagnetic layer made of “at least one element selected from a group consisting of Ru, Rh, Ir, Cr, Au, Ag, Pt and Pd.” Instead, the nonmagnetic layer of Saito et al. is made of Cu (col. 7, line 33). As mentioned above, Comparative Example 1 of the Saito et al. reference also lacks “a magnetic layer including Fe and Co,” which is also a feature defined in new independent Claim 17.

Claim 2 stands rejected under 35 U.S.C. §103 as being unpatentable over the Katada et al. publication in view of Osaka et al. Applicants respectfully traverse this rejection.

Claim 2 depends from independent Claim 1, and therefore includes all of the features of Claim 1, plus additional features. Accordingly, Applicants respectfully request that the §103 rejection of dependent Claim 2 under the Katada et al. publication in view of Osaka et al. be withdrawn considering the above remarks directed to independent Claim 1, and also because the Osaka et al. reference does not remedy the deficiencies discussed above.

Claim 7 stands rejected under 35 U.S.C. §103 as being unpatentable over the Katada et al. publication in view of Kamiguchi et al. Applicants respectfully traverse this rejection.

Claim 7 depends from independent Claim 1, and therefore includes all of the features of Claim 1, plus additional features. Accordingly, Applicants respectfully request that this §103 rejection of dependent Claim 7 be withdrawn considering the above remarks directed to independent Claim 1, and also because the Kamiguchi et al. reference does not remedy the deficiencies noted above.

Claim 2 stands rejected under 35 U.S.C. §103 as being unpatentable over the Iwasaki et al. reference in view of Osaka et al. Applicants respectfully traverse this rejection.

Claim 2 depends from independent Claim 1, and therefore includes all of the features of Claim 1, plus additional features. Accordingly, Applicants respectfully request that the §103 rejection of dependent Claim 2 under the Iwasaki et al. reference in view of Osaka et al. be withdrawn considering the above remarks directed to independent Claim 1, and also because the Osaka et al. reference does not remedy the deficiencies discussed above.

Claim 7 stands rejected under 35 U.S.C. §103 as being unpatentable over the Iwasaki et al. reference in view of Kamiguchi et al. and further in view of United States Patent Application Publication No. 202/0187565 to Inoue et al. Applicants respectfully traverse this rejection.

Claim 7 depends from independent Claim 1, and therefore includes all of the features of Claim 1, plus additional features. Accordingly, Applicants respectfully request that this §103 rejection of dependent Claim 7 be withdrawn considering the above remarks directed to independent Claim 1, and also because neither the Kamiguchi et al. reference nor the Inoue et al. reference remedy the deficiencies noted above.

Claim 10 stands rejected under 35 U.S.C. §103 as being unpatentable over the Iwasaki et al. reference in view of the Sun et al. publication. Applicants respectfully traverse this rejection.

Claim 10 depends from independent Claim 1, and therefore includes all of the features of Claim 1, plus additional features. Accordingly, Applicants respectfully request that this §103 rejection of dependent Claim 10 be withdrawn considering the above remarks directed to independent Claim 1, and also because the Sun et al. publication does not remedy the deficiencies noted above.

Claims 2 and 10 stand rejected under 35 U.S.C. §103 as being unpatentable over Saito et al. in view of Osaka et al. and further in view of the Sun et al. publication. Applicants respectfully traverse this rejection.

Claims 2 and 10 both depends from independent Claim 1, and therefore includes all of the features of Claim 1, plus additional features. Accordingly, Applicants respectfully request that this §103 rejection of dependent Claims 2 and 10 be withdrawn considering the above remarks directed to independent Claim 1, and also because neither the Osaka et al reference nor the Sun et al. publication remedy the deficiencies noted above.

Claim 7 stands rejected under 35 U.S.C. §103 as being unpatentable over the Iwasaki et al. reference in view of Kamiguchi et al. Applicants respectfully traverse this rejection.

Claim 7 depends from independent Claim 1, and therefore includes all of the features of Claim 1, plus additional features. Accordingly, Applicants respectfully request that this §103 rejection of dependent Claim 7 be withdrawn considering the above remarks directed to independent Claim 1, and also because the Kamiguchi et al. reference does not remedy the deficiencies noted above.

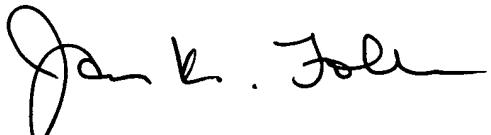
For all of the above reasons, Applicants request reconsideration and allowance of the claimed invention. Should the Examiner be of the opinion that a telephone conference

would aid in the prosecution of the application, or that outstanding issues exist, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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